

EXHIBIT 1:

Friends of Lake Monroe's Draft SIR Comments (Nov. 6, 2022)



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To: Chris Thornton, District Ranger, Hoosier National Forest
From: Friends of Lake Monroe
Date: 11-06-2022

Friends of Lake Monroe submits the following comments to Hoosier National Forest (HNF) regarding the Houston South Vegetation Management Draft Supplemental Information Report (SIR). Our comments were prepared by Dr. Sherry Mitchell-Bruker, a former federal research and supervisory hydrologist who had oversight of the best management program for Lassen National Forest. Friends of Lake Monroe is an independent nonprofit science-based organization dedicated to finding solutions to improve the water quality of Lake Monroe and enhancing its use as a drinking water, recreational, and ecological resource for all who use it.

Sincerely,

Sherry Mitchell-Bruker, President

Keith Bobay
Thomas Gallagher
James Krause
Cheryl Munson
Carolyn Waldron

HNF indicates that the SIR was prepared to provide clarification rather than conduct any new analysis or consider new information. In undertaking this clarification and reaching the conclusion in the SIR that the effects of this proposed project to Lake Monroe will be insignificant, HNF relied heavily on the Friends of Lake Monroe Watershed Management Plan (WMP) and HNF support of Friends of Lake Monroe's efforts. However, neither HNF's participation as a WMP steering committee member nor Friends of Lake Monroe's submission of a letter of support for a separate action (i.e., Friends of Lake Monroe's 319 application), can, as a practical matter, mitigate the highly significant impacts of the proposed project on Lake Monroe. Nor has HNF examined—let alone adopted—sufficient mitigation measures and practices that can bring the level of impacts to Lake Monroe below the threshold of “significance” as that term is defined by federal law.

Furthermore, selective quotes in the SIR from our WMP ignore the overriding theme of the report, which is that the sources of sediment and nutrients that degrade Lake Monroe water quality come from multiple land uses throughout the watershed. No single action or land use is solely responsible for Lake Monroe's serious water quality issues. It is the direct, indirect, and cumulative effects of *many* actions—in combination—that degrade Lake Monroe's water quality. In fact, our action plan specifically calls for reducing sediment and nutrient pollution, *not* increasing that pollution. But the proposed project will do the opposite by removing significant vegetation in the Lake Monroe watershed that would otherwise safeguard against erosion and sedimentation, and by burning vast swaths of forested lands that will contribute burnt sediment, toxic ash, and other harmful fire byproducts to Lake Monroe. Especially because many of the cumulative impacts result from private activities that will never receive *any* federal scrutiny under NEPA or other environmental laws, it was incumbent on HNF to objectively analyze the combined impacts of the proposed project with all foreseeable cumulative effects in the Lake Monroe watershed. HNF did not do so here.

It is difficult to overstate the paramount importance of Lake Monroe to Indiana's residents, and especially the residents of Monroe County. The City of Bloomington Utilities (CBU) draws its water from Lake Monroe. The Lake Monroe watershed spans 440 square miles and can be divided into four tenth level hydrologic unit code (HUC-10) watersheds: Lake Monroe-Salt Creek, North Fork Salt Creek, Middle Fork Salt Creek, and South Fork Salt Creek. These four HUC-10 watersheds comprise the municipal watershed. Reference in the SIR to the HUC-10 Lake Monroe-Salt Creek watershed as the "municipal watershed" is factually inaccurate and confuses nomenclature with reality. We would expect, having participated on the WMP steering committee, this distinction would be obvious to HNF. The proposed project is located within the South Fork Salt Creek watershed, primarily in the Negro Creek and Tipton Creek sub-watersheds. In fact, HNF designated the Negro Creek watershed as a priority watershed in 2018 precisely because of its value to the municipal water supply (SIR, pg. 11).

In any event, Friends of Lake Monroe did not collaborate with stakeholders to design an action plan that is restricted to the HUC 10 Lake Monroe Salt Creek watershed. We designed an action plan that spans *all four* of the HUC-10 watersheds. This is because small actions in all parts of the 440-square-mile watershed combine to cause highly significant impacts to water quality in Lake Monroe. Certainly, if we are willing to invest federal funds to enable local farmers to install cover crops on 10-acre fields in the area, we are acknowledging that when taken along with other actions, these cover crops will benefit Lake Monroe. In our view, HNF has greatly downplayed the effects that the proposed project will cause to Lake Monroe via erosion, sedimentation, and water quality concerns. Thus, we expect HNF to acknowledge that the proposed action, combined with other past, present, and future activities in the watershed will have undeniably significant effects. Erosion and nutrient runoff from thousands of acres cannot be dismissed. The failure to take a hard look at these impacts—consistent with the best available science—undercuts HNF's EA and SIR, as well as its decision not to prepare a more rigorous Environmental Impact Statement to consider the significant impacts of HNF's proposed project on Lake Monroe.

In addition, applying its specialized expertise to this matter, Friends of Lake Monroe has determined that HNF's Environmental Assessment (EA) and SIR do not adequately address the

direct, indirect, and cumulative effects of the proposed project on the water quality of Lake Monroe. As outlined in the Friends of Lake Monroe WMP, water quality in the lake is seriously degraded due to non-point source pollution that occurs throughout the watershed. No single land use is solely responsible, even though the combined effects to Lake Monroe, its aquatic flora and fauna, and Monroe County's residents are unequivocally significant. For instance, the cumulative effect of multiple land uses in the watershed and in-lake activities act in a synergistic way to overload the lake with sediment and nutrients, causing harmful algal blooms that reduce water quality, interfere with recreational activities, and contaminate drinking water. Friends of Lake Monroe recognizes that forestry on public land is held to a different and higher standard than private land, in light of the myriad federal laws that govern HNF's actions on National Forest System lands. In our WMP, we encourage private landowners to voluntarily adopt Best Management Practices (BMPs), knowing that there are some private logging operations that put water quality at grave risk. However, the fact that there are *other* sources contributing to Lake Monroe's increasingly degraded condition does not negate or diminish the *additive* and substantial risk posed by the large-scale logging and burning in proximity to Lake Monroe that is proposed by HNF in its EA and SIR. Put simply, it is scientifically and practically indefensible to assert that the proposed project will not result in significant impacts to Lake Monroe.

Moreover, the SIR glosses over basic scientific principles. For example, the SIR correctly states that the South Fork Salt Creek has more agricultural land than the North Fork Salt Creek, which is reflected by the higher levels of Nitrogen in the South Fork. However, the SIR failed to acknowledge that both the South Fork and North Fork are dominated by forested land and both streams are major contributors of Phosphorus, Nitrogen, and sediment to Lake Monroe. The SIR states "The impaired streams within the Houston South Project boundary are impaired due to E. Coli and low dissolved oxygen. None of the streams in the project area are impaired from siltation, algae growth, or nutrients." We expect federal hydrologists employed by HNF to understand, as a matter of basic hydrology, that low dissolved oxygen often occurs due to an excess of nutrients, which in turn stimulates primary production and depletes oxygen. But that is not reflected accurately in the SIR.

High levels of nutrients were identified at multiple sites within the South Fork Watershed, including high nutrient levels in the Tipton and Negro Creek sub-watersheds (Sullivan 2022) which are the main sub-watersheds in the proposed project boundary. In the USDA Forest Service Report and Map "Forests to Faucets" (USDA, 2022a), 73% of the Negro Creek sub-watershed is identified as National Forest land and 1.2% is in agriculture. The importance to drinking water is scored at 91 of 100, 100 being most important. The report estimates zero threats to the watershed from wildfire. Tipton Creek sub-watershed has a score of 90 for drinking water importance and zero for wildfire. They report 22.38% agricultural land and 25% National Forest land. 82% of the Lake Monroe watershed is forested and HNF occupies 18% of the entire watershed. Our WMP clearly indicates that agriculture is not the sole cause of nutrient and sediment loading and that erosion from disturbed steep slopes—as will occur from the proposed project—is a contributor to water quality degradation. The impaired Negro Creek watershed is proposed as a control for evaluating project effects. An already impaired stream, however, is not a valid control for monitoring, measuring, or assessing BMP effectiveness.

The threat to water quality from HNF's proposed extensive logging and burning might possibly be reduced by proper implementation of BMPs, but it will not be eliminated. The only way to genuinely ensure that there will be no significant impacts as a result of HNF's decision is to leave the forest intact and forgo logging and burning in the Lake Monroe watershed. There are multiple instances in the past year of prescribed burns that have resulted in undesired and unmitigated consequences. The most egregious of those is the U.S. Forest Service Calf Canyon Fire in New Mexico in which two prescribed burns supposedly mitigated by BMPs caused a catastrophic fire. The Calf Canyon Fire merged with the Hermits Peak fire, another prescribed burn set by the U.S. Forest Service, scorching more than 300,000 acres, destroying hundreds of homes, threatening many lives, and displacing thousands of people. The fire also impacted the Gallinas watershed, which supplies water to the community of Las Vegas. Journalists report that toxic ash entering the water system could make the water untreatable, forcing the town to rely on water supplies temporarily diverted and stored in reservoirs (ABQ 2022, KRQE 2022). At one point the town had less than 20 days of clean water left, and despite proposed stopgap solutions the only long-term fix proposed is replacing the town's entire water filtration system, at a potential cost of \$100 million (Romero 2022). This catastrophe could have been avoided if the U.S. Forest Service had not set those fires.

U.S. Forest Chief Randy Moore acknowledged that prescribed fires can escape control and become wildfires (WAPO May 27, 2022). He has stated that "We can never guarantee that prescribed fires won't escape because there are risks when we use this tool. It's a trade-off we have to take seriously together with communities." (USDA, 2022b). Hundreds of comments to HNF in response to the Draft EA reflect the unwillingness of this community to trade off the risk of further degradation of Lake Monroe water quality for a purportedly "healthier" forest that requires repeated logging and burning to maintain an unnatural forest composition and density.

Although these latest incidents illustrate the grave dangers of prescribed fire in heavily forested landscapes, they also illustrate the ineffectiveness of BMPs to fully mitigate impacts. Soil erosion and subsequent water quality degradation in the Lake Monroe watershed cannot be dismissed simply by citing the distance from the lake, the size of the watershed, or the additional pollution that derives from agriculture. While many water quality problems in Indiana are the result of agricultural runoff, agricultural use occurs on only a small percentage of the land in the watershed. HNF is the largest land owner or manager in the Lake Monroe watershed and thus has immense potential to either improve or harm water quality in Lake Monroe as a result of its land management decisions. Unfortunately, here, HNF chose the option that will *harm* water quality in Lake Monroe, and compounded this troubling decision by asserting, without any defensible rationale, that the direct, indirect, and cumulative impacts to Lake Monroe from the proposed project will not even be significant.

HNF's EA and SIR also ignore the ineffectiveness of prior mitigation efforts by HNF involving BMPs comparable to those proposed here. As we pointed out in our comments to the draft EA, HNF does not have a good track record on this point (FLM, 2019). If Best Management Practice implementation is used to indicate a load reduction, HNF must provide evidence from their BMP monitoring and evaluation reports of past forestry BMP implementation and effectiveness to support their conclusions.

For example, the improvements to the Buffalo Pike skid trail (SIR pg 23) occurred in 2019 *after* photos of the rutted trail were circulated to HNF by a conservation organization that observed the damage (personal comm., Stant 2022). The Buffalo Pike logging project occurred the year before, in 2018. This temporal gap between the impact and the mitigation is a common shortfall of BMP implementation in the HNF. Sudden storms and other unforeseen occurrences can lead to catastrophic ecological harms even when a BMP evaluation and monitoring plan is in place.

Photos of the Hickory Ridge portion of the project area further exemplify the failure of BMP effectiveness on the Hoosier National Forest. Figure 1 shows a gully leading from a HNF trail to a nearby stream.



Figure 1 Gully formed by trail runoff carries sediment to nearby stream (top center) in Lake Monroe Watershed.

This stream drains to the South Fork of Salt Creek and Lake Monroe. The stream is located within the proposed Houston South Project area where the landscape is dominated by steep slopes that are prone to erosion damage from site preparation and the aftermath of cutting operations, fires, and overgrazing (USDA 2019, Figure 2).

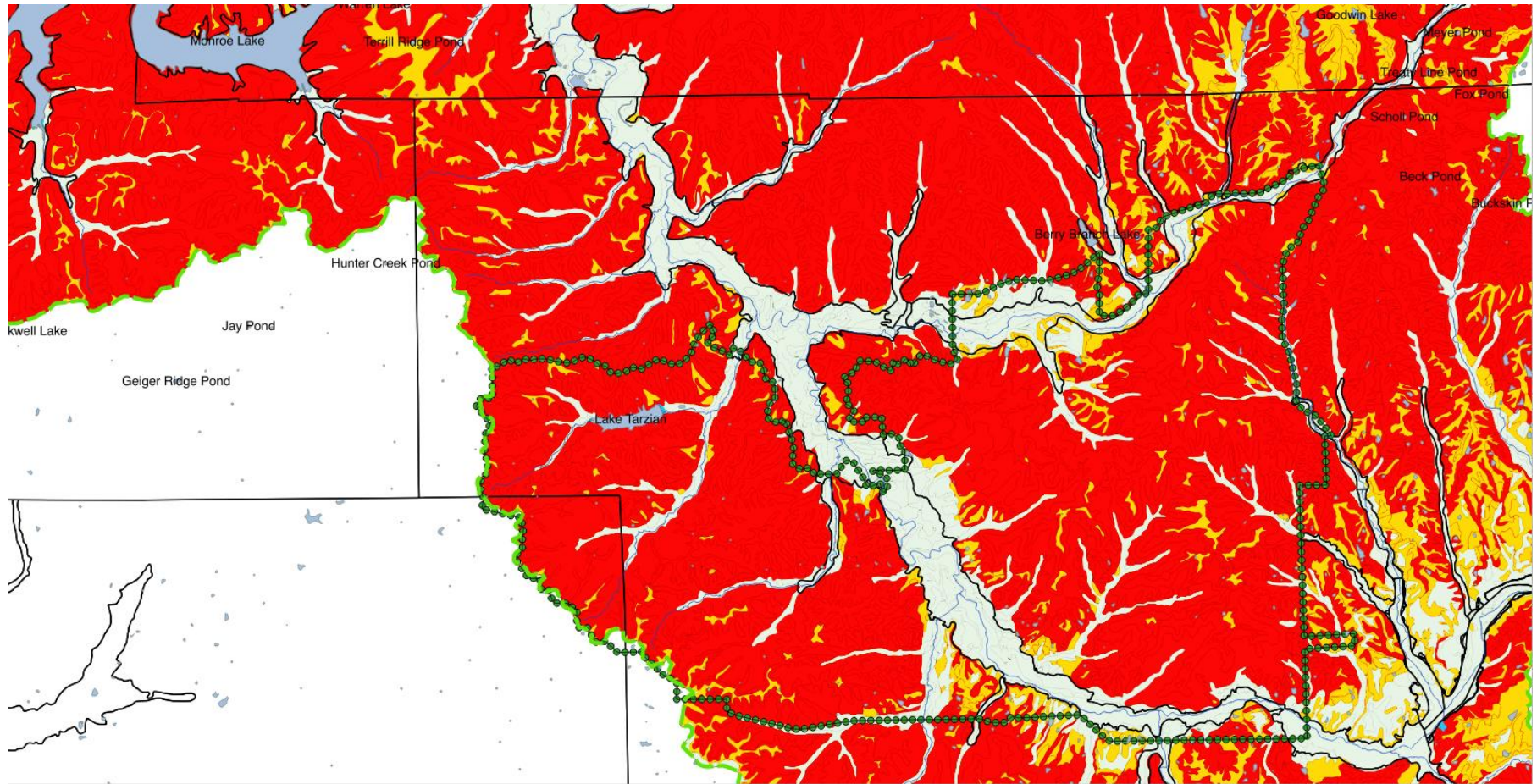


Figure 2 Severe Erosion Hazard Probability indicated by red filled areas (USDA 2019). Moderate Erosion Hazard Probability marked by yellow fill. Flood plain outlined by solid black line. Project boundary marked by green dotted line. Lake Monroe watershed outlined by lime green solid line.

Best management practices which are used by Hoosier National Forest specify protection of riparian management zones for perennial streams but not intermittent streams. This stream is classified as intermittent. Another site near this stream exhibited runoff from eroded trails and gullied trails that are adjacent to the stream. Gravel has been laid down in an effort to mitigate the damage, but the mitigation is not effective (Figure 3).



Figure 3 Failed BMP attempt near intermittent stream in proposed project area.

The stream bottom (not pictured) was very clear because the sediment coming into this stream has been carried downstream by high flows. During heavy storm events, erosion and runoff to streams throughout the watershed cause heavy sediment loading to Lake Monroe. These data, not considered by HNF, demonstrate that the Houston South project is proposed in an area that is unsuitable for logging, burning or road and trail-building and these activities, as proposed, have a high probability of causing sediment and nutrient pollution in Lake Monroe.

We also do not agree with HNF's irrational assertion in the SIR (pp 14, 20, 21) that HNF cannot adopt the "no action" alternative because such an approach would mean that HNF cannot implement various watershed improvement projects to benefit Lake Monroe's water quality (such as vernal ponds and culverts) that it has proposed as part of this project. However, Friends of Lake Monroe and other stakeholders with specialized knowledge of local water quality issues have specifically requested that HNF consider and examine an alternative that would allow for

these watershed improvement projects *without* undertaking the proposed vegetation management activities—i.e., logging and burning (Friends of Lake Monroe comments on EA). Yet, to date, HNF has avoided this analysis despite NEPA’s requirement that the agency must consider all feasible alternatives. Indeed, HNF acknowledges there is potential funding for these watershed improvement projects through a watershed restoration action plan (pg 12 SIR), but HNF nonetheless refused to consider this alternative without any coherent rationale for its omission.

In sum, Friends of Lake Monroe does not endorse the analysis or conclusions contained in the SIR, nor does HNF’s participation in our WMP steering committee excuse the agency from satisfying its legal duties under NEPA. We urge HNF to seriously consider the effect of the proposed project in comparison to alternatives that improve water quality without disrupting the existing forest community. We also urge HNF to prepare an Environmental Impact Statement to consider and evaluate the indisputably significant impacts that the proposed project will cause to the HNF’s ecosystem, Lake Monroe, and the tens of thousands of Indiana residents that rely on Lake Monroe for drinking water, recreation, and other purposes. We remain available to collaborate with the Forest Service to identify and fund water quality improvement projects in HNF for future implementation, in the event that this proposed project does not proceed.

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ABQ, 2022. *"Hermits Peak Fire threatens Las Vegas' main water supply - Albuquerque Journal"*. www.abqjournal.com. Retrieved 2022-05-06.

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USDA, 2022a. Forest to Faucets 2.0. USDA Forest Service, <https://www.fs.usda.gov/treesearch/pubs/63723>

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WAPo, 2022. *Forest Service finds its planned burns sparked N.M.'s largest wildfire*. Washington Post, May 27, 2022. <https://wapo.st/3gAnqgr>.

Curriculum Vita
SHERRY MITCHELL-BRUKER, Ph.D.

APPLIED SCIENCE AND RESEARCH EXPERIENCE

Lassen National Forest

Forest Hydrologist/Watershed Program Manager

Led team of hydrologists and soil scientists to plan and implement water and soils-related activities on Forest. Supervised Best Management Practice Evaluation Program. Coordinated Burned Area Emergency Response. Managed projects and budgets for watershed improvement.

Wittman Hydro Planning Associates, Inc.

Senior Scientist

Led and conducted modeling studies to advise municipal water companies on water supply sources, well field operations, pumping impacts and sustainability. Analyzed stream flow, regional water trends and use to determine interaction between rivers, streams and well discharge.

Everglades National Park

Lead Hydrologist, Modified Water Deliveries Project

Provided expertise and analysis in planning for water delivery project to Everglades National Park. Provided leadership and support to team members. Prepared scientific documents to assess the impact of proposed plans on fish and wildlife.

Research

- Modeled groundwater and surface water flow to assess impacts of proposed and current operations on hydrology and ecology of the Southern Everglades
- Evaluated impacts of water operations on habitat of the Cape Sable seaside sparrow
- Designed and oversaw multi-disciplinary field investigation to document the importance of water flow to the Everglades ridge and slough ecology.
- Investigated co-evolution of soils, vegetation and hydrology in Everglades Ridge and Slough Marsh and Tree Islands.
- Evaluated modeling approaches for simulating groundwater and surface water interactions in the Everglades.

Co-chair Critical Ecosystem Studies Initiative Hydrologic Modeling Committee

Led multi-agency research program to address research needs to support Everglades restoration. Solicited proposals, made recommendations for distributing research funds and tracked progress of funded research.

Co-chair Recover Model Refinement Team Led multi-agency team to support hydrological and biological model development, review and dissemination to implement Everglades restoration.

Recover Leadership Team Served on leadership team responsible for guiding adaptive assessment for the Comprehensive Everglades Restoration Program.

Expert Witness Provided significant testimony supporting the Department of Interior in the decision of the lead land acquisition case for the Everglades National Park expansion project.

Environmental Hydrology

Heltonville, IN

Principal Hydrologist

- Modeled groundwater flow and groundwater and surface water interactions to delineate wellhead protection areas for municipal wellfields in Indiana and Michigan.
- Modeled hydrologic and sediment budget and modeled groundwater and surface water interactions in the Lake Monroe, Indiana watershed.
- Conducted workshops in groundwater flow modeling.

Academic Appointments

School of Public and Environmental Affairs

Indiana University, Bloomington IN

Visiting Assistant Professor

Taught graduate capstone course in evaluating Everglades restoration projects

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Department of Geography

Indiana University, Bloomington, IN

Visiting Assistant Professor

- Taught course in Physical Systems of the Environment.
- Participated in faculty meetings and weekly colloquium

School of Public and Environmental Affairs

Indiana University, Bloomington, IN

Adjunct Instructor

- Taught course in Mathematics for Environmental Science
- Member of teaching team for course in Techniques in Environmental Science (Statistics section).

Oakland City University/Bedford College Center

Bedford, IN

Adjunct Instructor

Taught courses in Introductory Biology, Biology Laboratory, Introductory Chemistry, Chemistry Laboratory, Physical Science, and Elementary Algebra.

EDUCATION

Ph.D., Environmental Science School of Public and Environmental Affairs,
Indiana University, Bloomington, Indiana. (133 semester hours)

Concentration: Hydrology.

Thesis title: Modeling Steady State Groundwater and Surface Water Interactions.

M.S., Environmental Science School of Public and Environmental Affairs,
Indiana University, Bloomington, Indiana. (59 semester hours)

Concentration: Aquatic Field Biology.

B.A., Biology Department of Biology, Bellarmine College,
Louisville, Kentucky. (140 semester hours)

Concentration: Biology, Chemistry.

SELECTED PUBLICATIONS AND REPORTS (16/33)

Hill, Barry and Sherry Mitchell-Bruker, 2009. *Discussion of "A framework for understanding the hydroecology of impacted wet meadows in the Sierra Nevada and Cascade Ranges, California, USA," by S.P. Loheide II, Richard S. Deitchman, David J. Cooper, Evan C. Wolf, Christopher T. Hammersmark, and Jessica D. Lundquist: Hydrogeology Journal 17: 229-246, 2009.* Hydrogeology Journal, Springer, Netherlands.

Wittman Hydro Planning Associates, 2007. Optimization, Impact and Drought Analysis for Indianapolis South Well Field.

Leonard, Lynn, A. Croft, D. Childers, **S. Mitchell-Bruker**, H. Solo-Gabriele and M. Ross, 2006. *Characteristics of surface-water flows in the ridge and slough landscape of Everglades National Park: implications for particulate transport.* Hydrobiologia. Springer, Netherlands. Hydrobiologia v.569(1) October 2006. Springer, Netherlands.

Ross, Michael, **S. Mitchell-Bruker**, J. P. Sah, S. Stothoff, P. L. Ruiz, D.L. Reed, K. Jayachandran, and C.L. Coultas, 2006. *Interaction of hydrology and nutrient limitation in the Ridge and Slough landscape of the southern Everglades.* Hydrobiologia v.569(1) October 2006. Springer, Netherlands.

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Haitjema, Henk and **Sherry Mitchell-Bruker**, 2005. *Are Water Tables a Subdued Replica of the Topography?* Groundwater, v 43(6) pp 781-786.

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- Mitchell-Bruker, Sherry.**, J. Bazante, D. Childers, L. Leonard, M. Ross, H. Solo-Gabriele, R. Snow, S. Stothoff, 2005. *Effect of Hydrology on Everglades Ridge and Slough Community*. Report to Everglades National Park, Homestead, FL.
- U.S. Fish and Wildlife Service/Everglades National Park, 2001. *Fish and Wildlife Coordination Act Report for the Interim Operational Plan, Alternative 7*. U.S. Army Corps of Engineers, Jacksonville, FL.
- Mitchell-Bruker, Sherry.**, F. James, E. Knight, T. Van Lent. 2001. *An Evaluation of the Interim Structural and Operational Plan For Hydrologic Compliance with the ^{SEP}Cape Sable Seaside Sparrow Biological Opinion for the Year 2000*. Everglades National Park, Homestead, FL.
- U.S. Fish and Wildlife Service/Everglades National Park, 1999. *8.5 Square Mile Area Supplemental Environmental Impact Statement Fish and Wildlife Coordination Act Report*. U.S. Army Corps of Engineers, Jacksonville, FL.
- Mitchell-Bruker, Sherry.** 1998. *Wellhead Protection Area Delineation: Charlotte, Michigan*. Peerless-Midwest, Inc., Granger, Indiana.
- Jones, W., M. Jenson, Eric Jourdain, **S. Mitchell-Bruker**, L. Strong, L. Bieberich, J. Helmuth, and T. Kroeker, 1997. *Lake Monroe Diagnostic and Feasibility Study*. School of Public and Environmental Affairs, Indiana University, Bloomington, Indiana.
- Mitchell-Bruker, Sherry.** and H. M. Haitjema. 1996. Modeling Steady State Groundwater and Surface Water Interactions with Analytic Elements. *Water Resources Research*, 32(9).
- Luther, K., **S. Mitchell-Bruker**, and H. M. Haitjema. 1995. *Analytic Element Modeling of the Walnut Creek Watershed*. Report to USEPA, Ada, Oklahoma.

Selected Conference Presentations

- Mitchell-Bruker, Sherry.** *Everglades Restoration and the Search for a Supermodel*. American Geophysical Union, Fall Meeting, San Francisco, CA, December 2004.
- Mitchell-Bruker, Sherry.** *Quantifying Restoration Values*. Invited Lecture. Indiana University School of Public and Environmental Affairs, Bloomington, IN. April 2004.
- Mitchell-Bruker, S.** *Restoration activities in Everglades National Park (oral)*. Florida Coastal Everglades Long Term Ecological Research Site All Scientists Meeting, Coral Gables, FL, March 2004.
- Mitchell-Bruker, Sherry.** *Modeling Evolution of Topography and Hydrology of the Greater Everglades*. Long Term Ecological Research Program All Scientists Meeting. Seattle, WA, September 2003.
- Mitchell-Bruker, Sherry.** *Hydrologic Controls on Everglades Landscape Form and Function: Physical, Chemical and Biotic Interactions*. American Geophysical Union, Fall Meeting, San Francisco, CA, December 2003.
- Mitchell-Bruker, Sherry.**, and D. Childers, L. Leonard, M. Ross, H. Solo-Gabriele, S. Stothoff. *Determining the Role of Sediment Deposition and Transport in the Formation and Maintenance of Tree Islands in the Florida Everglades (poster)*. American Geophysical

Mitchell-Bruker, Sherry. and E. Crisfield. *Modeling Soil Subsidence Rates for Drained Organic Soils (poster)*. Greater Everglades Ecosystem Restoration Conference. Naples, FL, 2000.

Mitchell-Bruker, S., Fisher, A., Wheat G., Ortoleva, P. *Silica Diagenesis and Transport in Mid-ocean Ridge Flanks. (poster)*. American Geophysical Union Spring Meeting. Boston, MA, 1998

Mitchell-Bruker, Sherry. *Climate Effects on Groundwater-Mediated Channel Erosion*. Indiana Water Resources Association Spring Symposium. Clifty Falls State Park, July 1996.

SERVICE

Founder and President, Friends of Lake Monroe

Hospice volunteer, Hospice of Bloomington Hospital/TU Health

Literacy Tutor, Monroe County Library

Board Member, Sanshin Zen Community

Ph. D. Thesis Committee, Jose Bazante, University of Miami, College of Engineering.

Reviewer Journal of Hydrology, Wetlands, Hydrobiologia.

Florida Coastal Everglades Long Term Ecological Research Site Soils Working Group.

Everglades National Park Science Planning Team.

Everglades National Park Wilderness Committee.

Southern Indiana Regional Science Fair Judge.

Indiana High School Science Olympiad Event coordinator